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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,436	04/21/2004	Yasuhisa Kitahara	023971-0411	5496
22428	7590	05/03/2005	EXAMINER	
FOLEY AND LARDNER SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			NGUYEN, TU MINH	
			ART UNIT	PAPER NUMBER
			3748	

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/828,436

Applicant(s)

KITAHARA ET AL.

Examiner

Tu M. Nguyen

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 042104.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 11 is objected to because on line 22 of the claim, "capable of" renders the claim indefinite. Thus, "capable of" should read --adapted for--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4, 7, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Murachi et al. (U.S. Patent 5,746,989).

Re claims 1 and 12, as shown in Figures 1-5, Murachi et al. disclose an exhaust emission control system of an internal combustion engine and a method of operating an exhaust purifying device, the system comprising:

- an exhaust purifying device (7, 9) arranged in an exhaust gas passage extending from the engine, the exhaust purifying device including a NOx trapping catalyst (9) that traps NOx in the exhaust gas when an exhaust air-fuel ratio is leaner than stoichiometric and releases the trapped NOx therefrom when the exhaust air-fuel ratio is richer than stoichiometric (lines 59-63 of column 4), and a particulate filter (7) that collects a particulate matter in the exhaust gas;

Art Unit: 3748

- a condition detecting device (20, speed sensor, pedal sensor) that detects a condition of the particulate filter (an amount of accumulated particulate matter in the particulate filter is determined by an accumulated value of fuel injection amount (lines 57-65 of column 3); also see Figures 3 (steps 301-313) and line 45 of column 11 to line 15 of column 12); and

- an exhaust air-fuel ratio control device (20) that controls the exhaust gas from the engine in such a manner that the exhaust gas has a target exhaust air-fuel ratio (lines 47-53 of column 10),

wherein the exhaust air-fuel ratio control device is configured to carry out: upon changing of the exhaust air-fuel ratio from a stoichiometric or richer side to a leaner side (step 315 with YES answer, step 323 with YES answer, step 325, step 315 with NO answer, step 319, step 213 with NO answer, and step 219) (also see lines 47-53 of column 10), varying the exhaust air-fuel ratio under the leaner air-fuel exhaust condition in accordance with the condition of the particulate filter (step 301 with YES answer, step 313, step 201 with YES answer, step 205 with NO answer, step 209) (also see lines 23-44 of column 9).

Re claims 2 and 4, in the system of Murachi et al., the condition detecting device estimates an amount of the particulate matter that would be collected and deposited on the particulate filter, and in which the exhaust air-fuel ratio control device varies the target exhaust air-fuel ratio under the leaner air-fuel exhaust condition only when the estimated amount of the collected and deposited particulate matter (FD) exceeds a predetermined amount (FDo) (step 301 with YES answer, step 313, step 201 with YES answer, step 205 with NO answer, step 209) (also see lines 23-44 of column 9); wherein the exhaust air-fuel ratio control device controls the

Art Unit: 3748

target exhaust air-fuel ratio under the leaner air-fuel exhaust condition in such a manner as to lower an oxygen concentration in the exhaust gas as the amount of the deposited particulate matter increases.

Re claim 7, in the system of Murachi et al., the exhaust air-fuel ratio control device (20) controls the exhaust air-fuel ratio to the target ratio by controlling an amount of intake air fed to the engine.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 5, 6, and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murachi et al. as applied to claim 1 above, in view of van Nieuwstadt et al. (U.S. Patent Application 2003/0200745).

Re claim 3, the system of Murachi et al. discloses the invention as cited above, however, fails to disclose that the condition detecting device detects a temperature of the particulate filter, and in which the exhaust air-fuel ratio control device varies the target exhaust air-fuel ratio under the leaner air-fuel exhaust condition when the temperature of the particulate filter exceeds a predetermined temperature.

As illustrated in Figures 1, 3, and 4, van Nieuwstadt et al. teach that it is conventional in the art to utilize temperature sensors (97 or 98) to detect a temperature of a particulate filter (96), in which a controller (12) varies a target exhaust air-fuel ratio under the leaner air-fuel exhaust condition when the temperature of the particulate filter exceeds a predetermined temperature (step 312 with YES answer and step 318) in order to prevent thermal damage to the filter. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by van Nieuwstadt et al. in the system of Murachi et al., since the use thereof would have provided a durable particulate filter.

Re claim 5, in the modified system of Murachi et al., the exhaust air-fuel ratio control device (20) controls the target exhaust air-fuel ratio under the leaner air-fuel exhaust condition in such a manner as to lower an oxygen concentration in the exhaust gas as the temperature of the particulate filter increases (see paragraph 0039 in van Nieuwstadt et al.).

Re claim 6, in the modified system of Murachi et al., the exhaust air-fuel ratio control device varies the target exhaust air-fuel ratio under the leaner air-fuel exhaust condition when the engine is under a predetermined operation condition (see step 314 and paragraph 0037 in van Nieuwstadt et al.).

Re claim 8, the modified system of Murachi et al. further comprises an EGR device that feeds a part of the exhaust gas of the engine back to an intake system of the engine (see Figure 1 of van Nieuwstadt et al. where an EGR valve (90) is shown); wherein the exhaust air-fuel ratio control device controls the exhaust air-fuel ratio to the target ratio by controlling an amount of

Art Unit: 3748

the exhaust gas fed back to the intake system of the engine (see paragraph 0039 in van Nieuwstadt et al.).

Re claim 10, in the modified system of Murachi et al., the NOx trapping catalyst is arranged upstream of the particulate filter (in van Nieuwstadt et al., the lean NOx catalyst (95) is arranged upstream of the particulate filter (96)).

***Allowable Subject Matter***

6. Claim 11 is objected to and would be allowable if rewritten or amended to overcome the Claim Objection set forth in this Office Action.

***Prior Art***

7. The IDS (PTO-1449) filed on April 21, 2004 has been considered. An initialized copy is attached hereto.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of five patents and one patent application: Hirota et al. (U.S. Patent 5,974,791), Hirota et al. (U.S. Patent 6,233,927), Khair et al. (U.S. Patent 6,718,757), Taylor et al. (U.S. Patent 6,843,054), Twigg (U.S. Patent 6,863,874), and van Nieuwstadt et al. (U.S. Patent Application 2005/0086933) further disclose a state of the art.

Art Unit: 3748

*Communication*

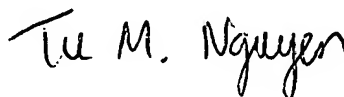
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

May 1, 2005



Tu M. Nguyen

Primary Examiner

Art Unit 3748